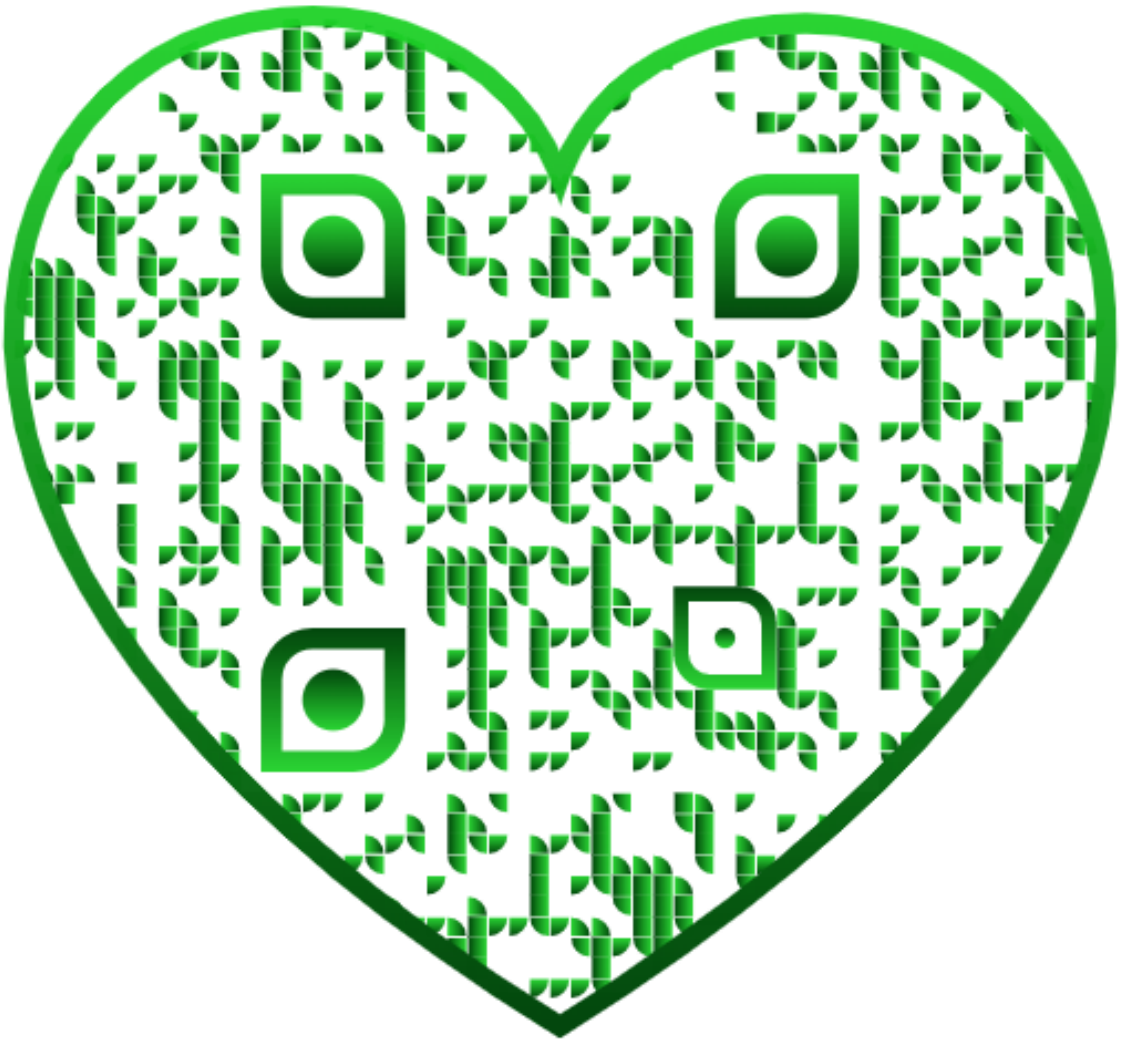
Histology of Endocrine System

BY: DR. OMAR AD.



Pituitary gland

- The **pituitary gland** has two major parts: the **posterior** (**pars nervosa)** a downgrowth of the brain attached to the **hypothalamus** by the **infundibulum**.
- The anterior pituitary includes the large **pars distalis**, the **pars tuberalis (**that surrounds the infundibulum), and the thin **pars intermedia**.

Pituitary gland

- Endocrine cells of the anterior pituitary can be called **acidophils**, **basophils**, or **chromophobes** based on their staining properties; **chromophobes** lack secretory granules and **stain poorly**.
- Acidophils and basophils can be identified as to which pituitary hormone they produce using **immunohistochemistry** and antibodies against specific hormones.
- Acidophils are primarily **somatotrophs** producing **somatotropin** (**growth hormone**), or **lactotrophs** (or mammotrophs) producing **prolactin** (**PRL**).
- Basophils include **gonadotrophs** producing **follicle-stimulating hormone** (**FSH**) and **luteinizing hormone** (**LH**) and **thyrotrophs** making **thyroid-stimulating hormone** (**TSH**).

Pituitary gland

- A third type of basophil is the **corticotroph**, make **adrenocorticotropic hormone** (**ACTH**) and **β-lipotropic hormone** (**LPH**).
- The **hypothalamic hypophyseal tract** includes bundles of nerve axons that run from hypothalamus to the **posterior pituitary**.
- Hypothalamic neurons synthesize **vasopressin/antidiuretic hormone** (**ADH**) and oxytocin, both of which are stored in axonal dilations called **Herring bodies** before release to capillaries in the posterior pituitary.

FIGURE 20–2 Pituitary gland.

Hypothalamus

Mammillary body

Median eminence

Optic chiasm

Infundibulum

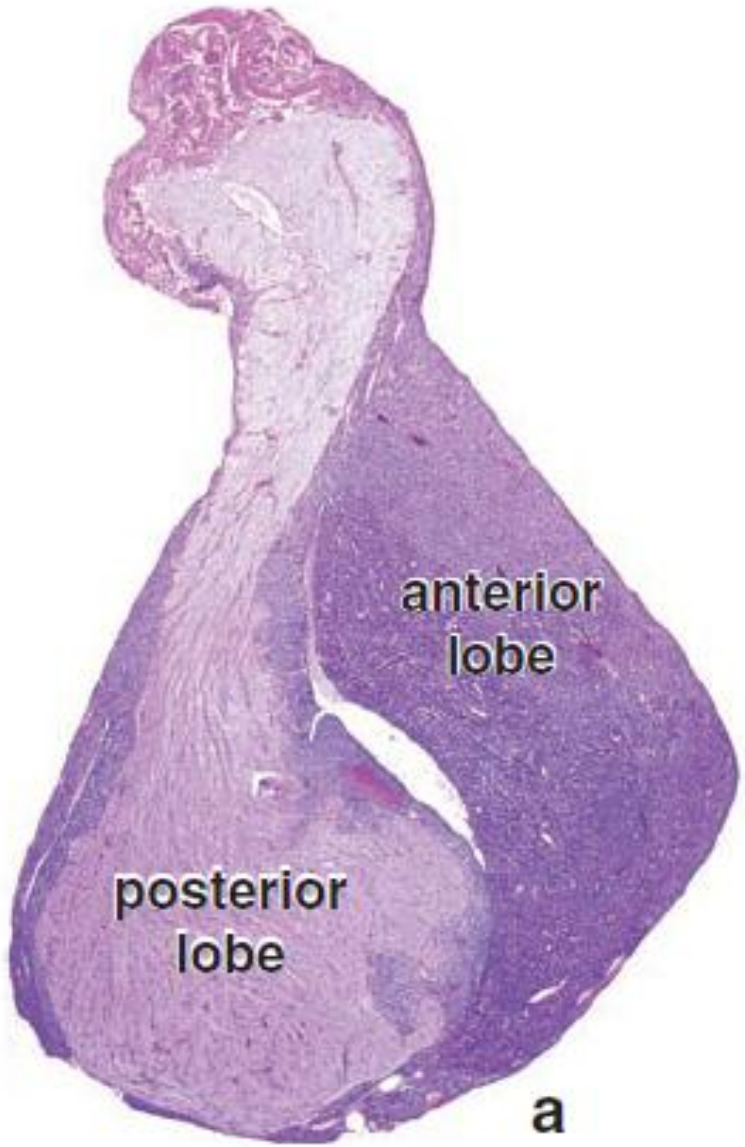
Anterior pituitary

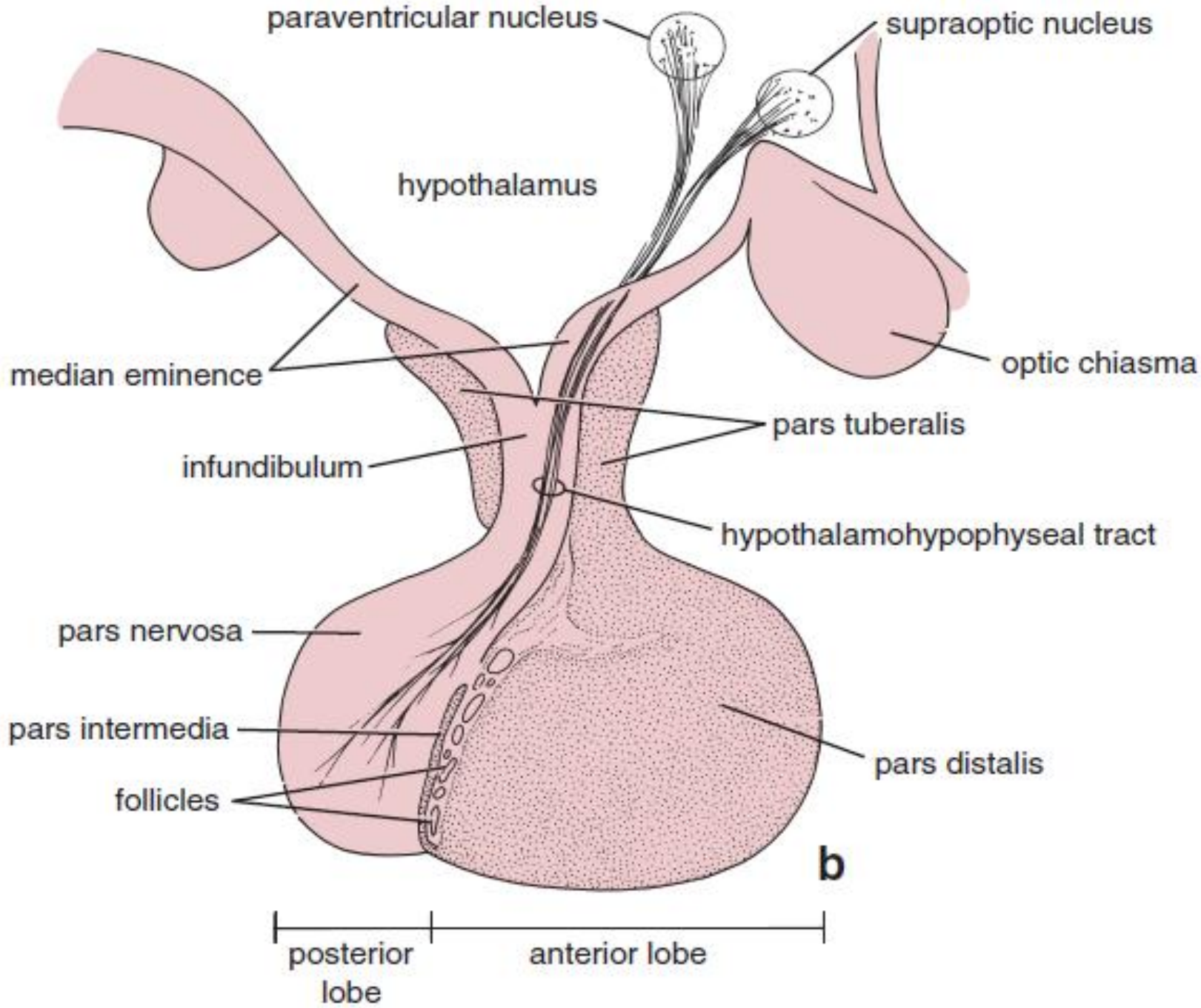
- Pars tuberalis
- Pars intermedia
- Pars distalis

Posterior pituitary

- Infundibular stalk
- Pars nervosa

Hypophyseal fossa in sella turcica of sphenoid bone


anterior lobe
posterior lobe
a


paraventricular nucleus
supraoptic nucleus
hypothalamus
median eminence
optic chiasma
pars tuberalis
infundibulum
hypothalamohypophyseal tract
pars nervosa
pars intermedia
pars distalis
follicles
b
posterior lobe
anterior lobe

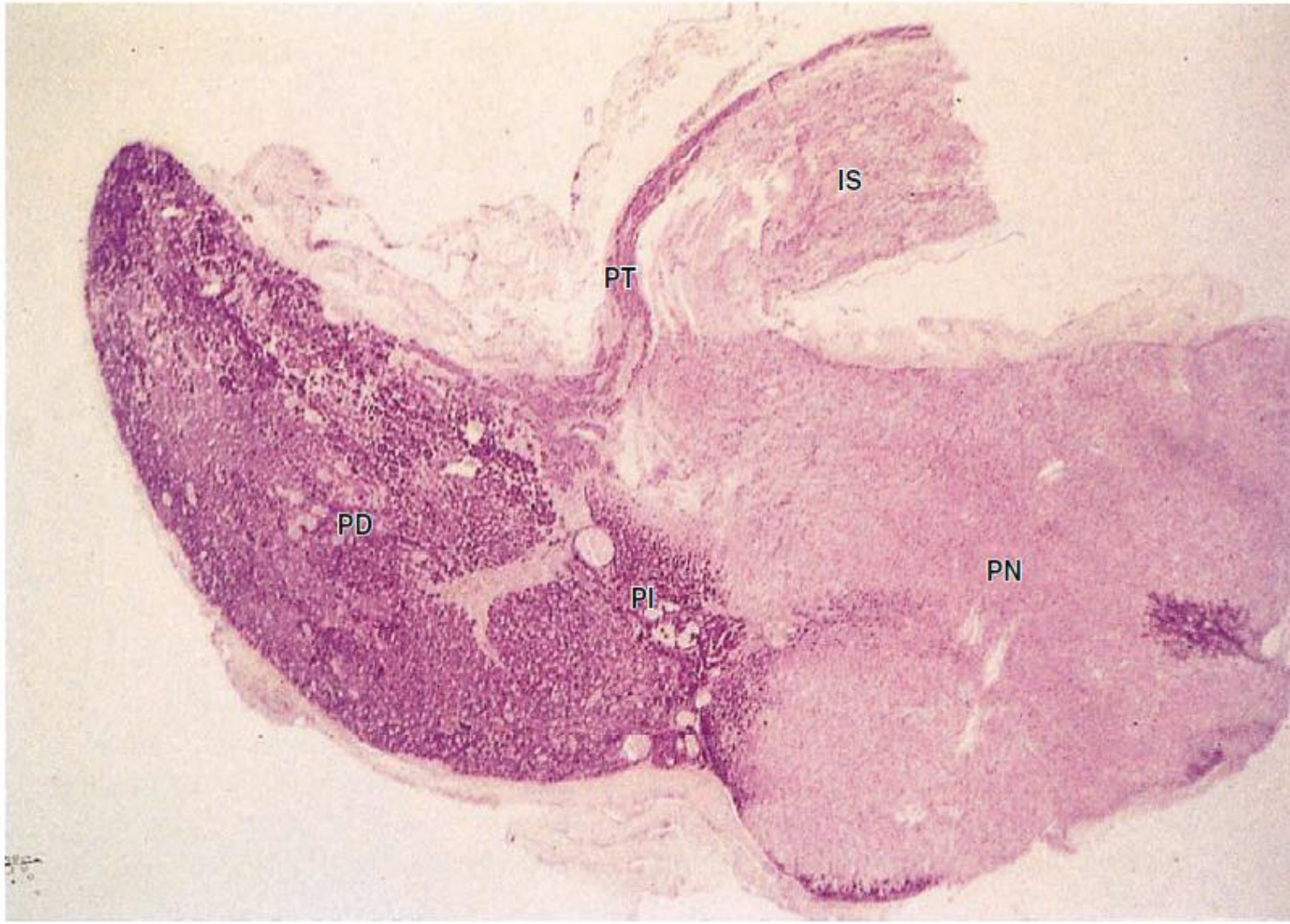
Pituitary gland

The two parts of the pituitary gland reflect their origins, as seen in this low-magnification section of an entire gland.

The infundibular stalk (IS) and pars nervosa (PN) of the neurohypophysis resemble CNS tissue, while the adenohypophysis' pars distalis (PD), pars intermediate (PI), and pars tuberalis (PT) are typically glandular in their level of staining.

Stain: H&E

FIGURE **20–4** Pituitary gland.



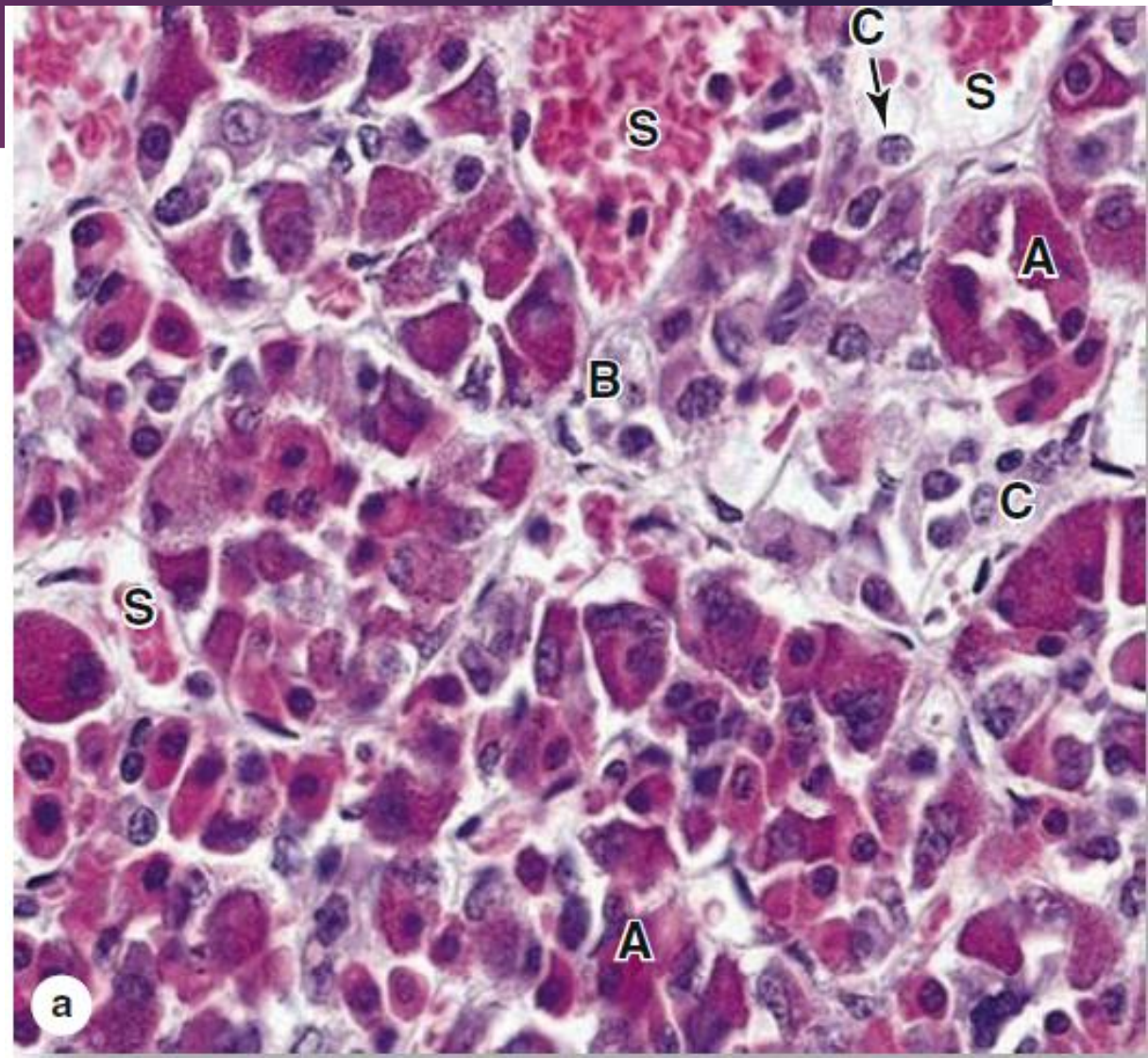
Pars Distalis

parenchymal cells of the pars distalis are subdivided into **acidophil cells** (**A**), **basophils** (**B**), and **chromophobes** (**C**) in which the cytoplasm is poorly stained.

Also shown are capillaries and sinusoids (**S**).

Cords of acidophils and basophils vary in distribution and number but are always closely associated with microvasculature that carries off secreted hormones into the general circulation.

Stain: H&E



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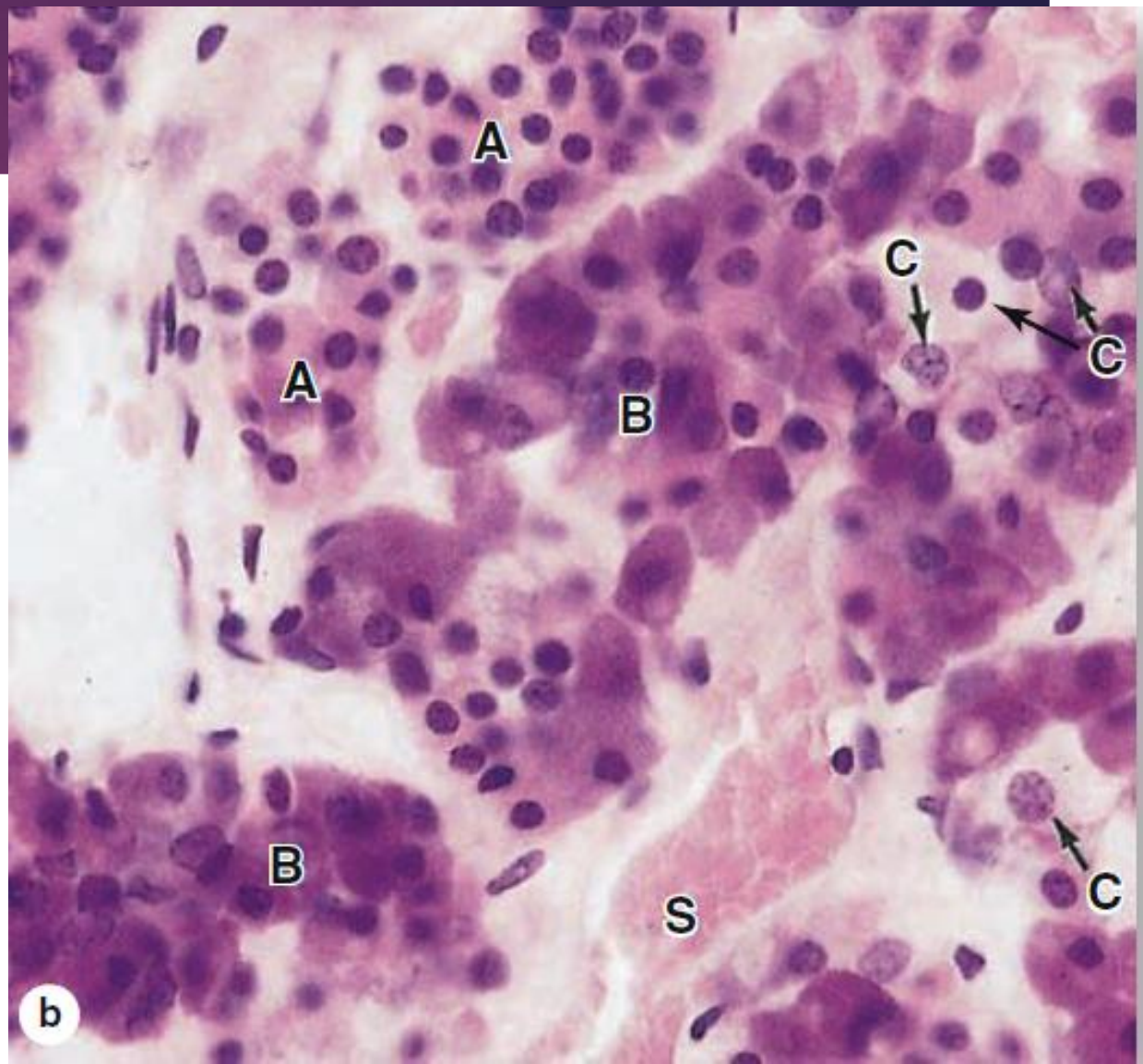
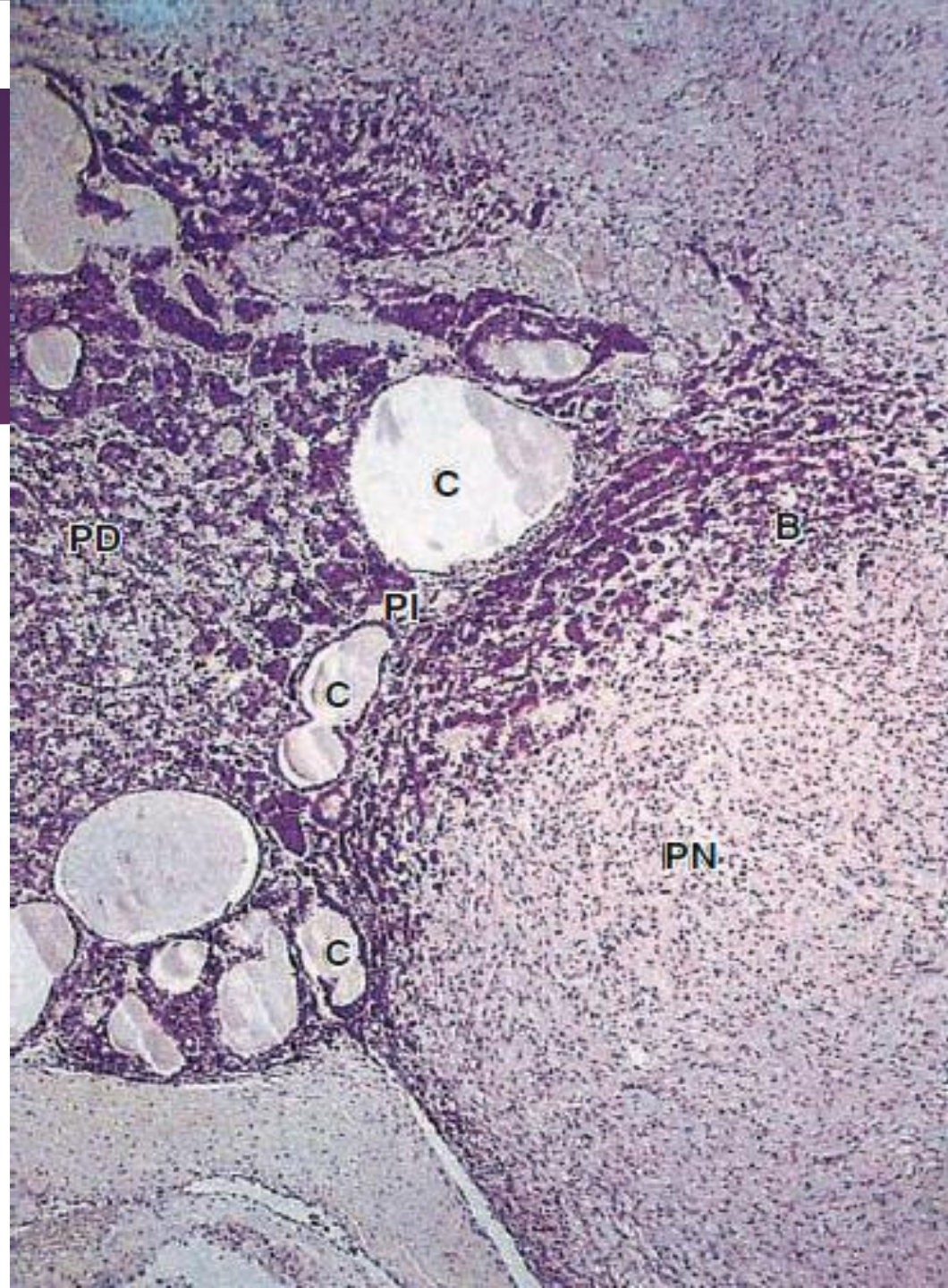


Pars Intermedia

The pars intermedia (**PI**) is a narrow region lying between the pars distalis (**PD**) and the pars nervosa (**PN**), with many of its basophils (**B**) often invading the latter.

Remnants of the embryonic hypophyseal pouch's lumen are usually present in this region as colloid-filled cysts (**C**) of various sizes. Function of this region in humans is not clear.

H&E



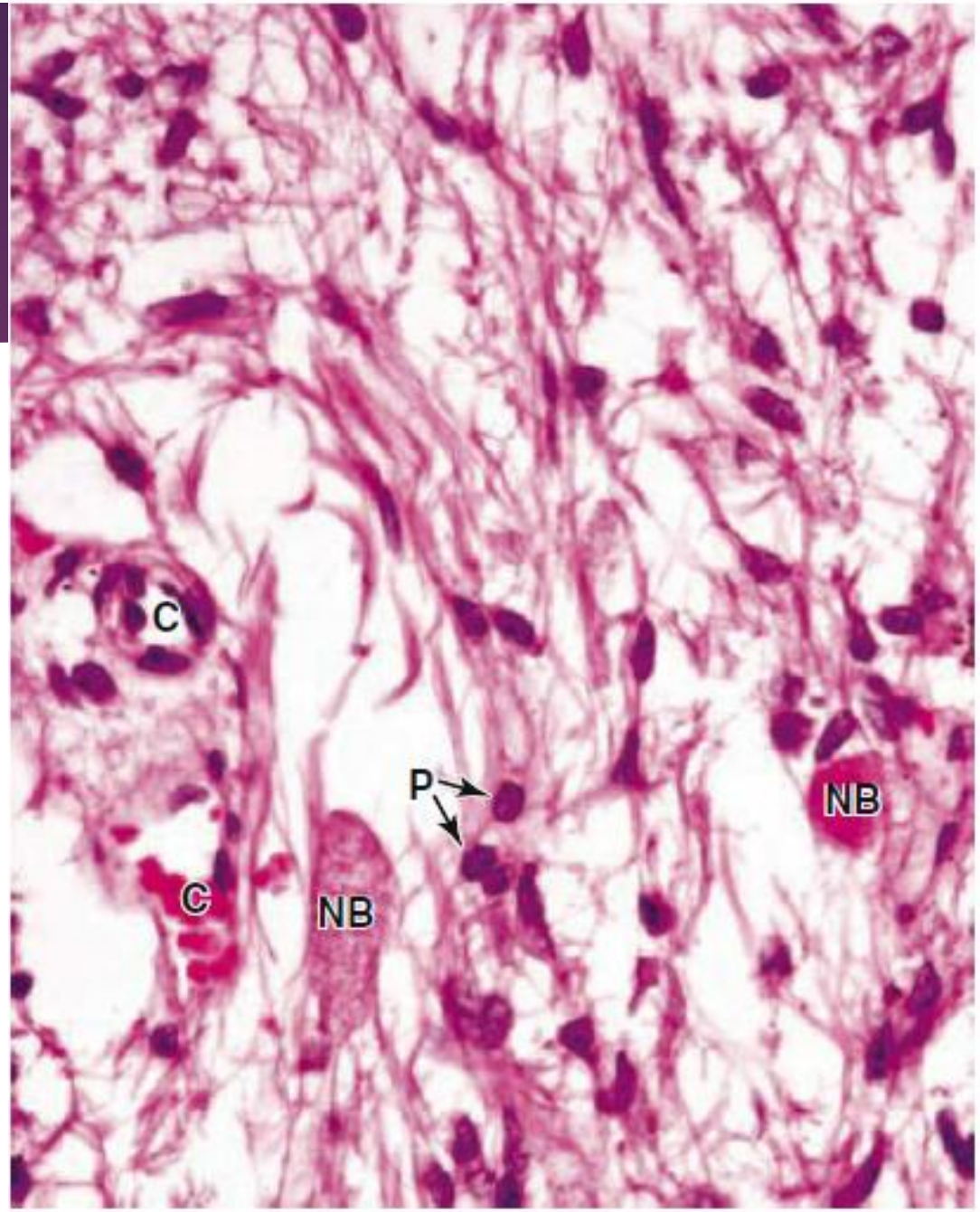
Pars Nervosa

The pars nervosa consists of modified neural tissues containing unmyelinated axons supported and by glia cells **pituicytes** (**P**), the most numerous cell present.

The axons have swellings called **neurosecretory** (**Herring**) **bodies** (**NB**) from which oxytocin or vasopressin is released.

The released hormones are picked up by capillaries (**C**) for distribution.

Stain: H&E



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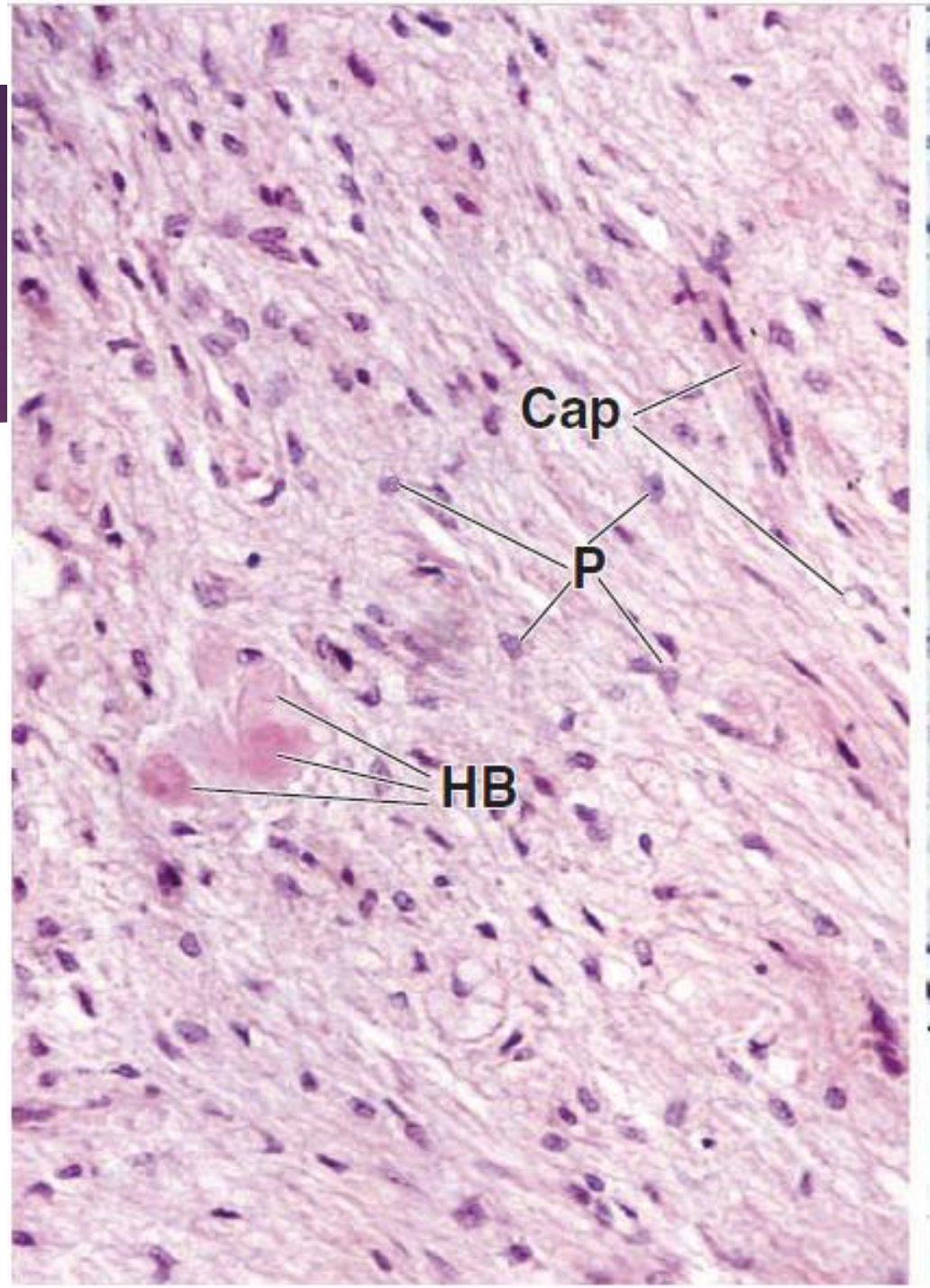

Thank you..